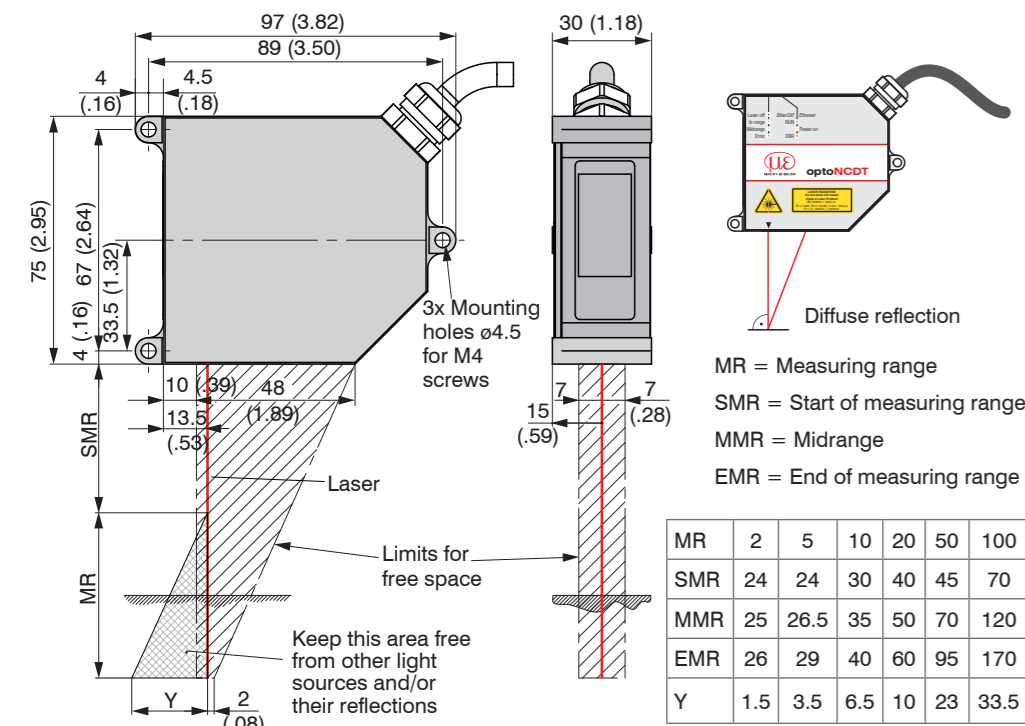## Proper Environment

- Protection class: IP 65 (applies only when the sensor cable is plugged in)
- Operating temperature: 0 °C ... 50 °C (+32 up to +104 °F)
- Storage temperature: -20 °C ... 70 °C (-4 up to +158 °F)
- Humidity: 5 - 95 % (no condensation)
- Ambient pressure: Atmospheric pressure
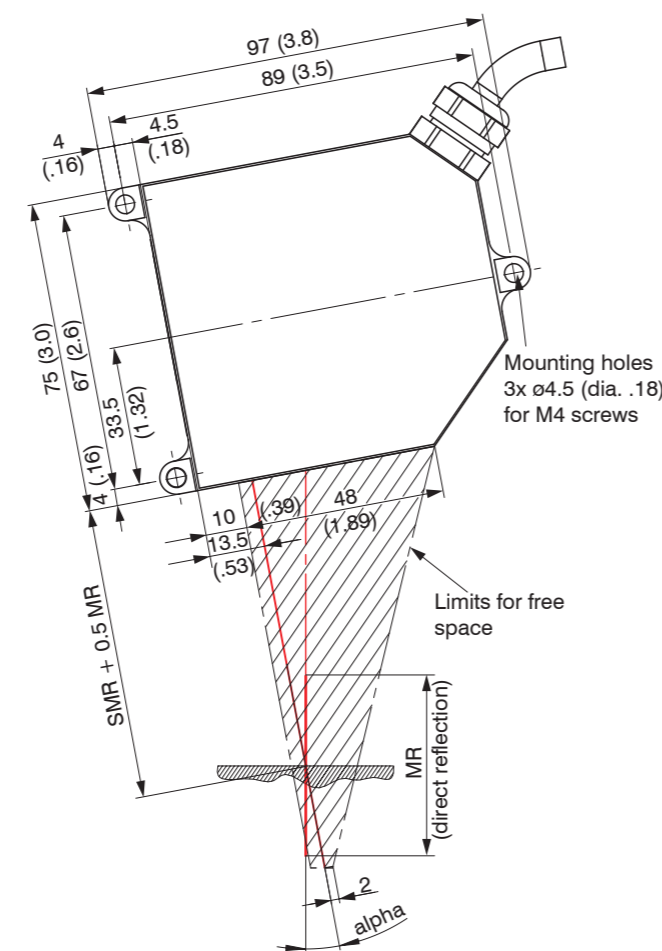
Sensor Mounting, Diffuse Reflection

The optoNCDT 2300 sensor is an optical system for measurements with micrometer accuracy.

i Make sure it is handled carefully when installing and operating!

➡ Mount the sensor only to the existing holes on a flat surface. Clamps of any kind are not permitted.

➡ Mount the sensor by means of 3 screws type M4. The bearing surfaces surrounding the fastening holes (through-holes) are slightly raised.

Diffuse Reflection, Dimensions and free space, Measuring ranges 2/5/10/20/50/100 mm
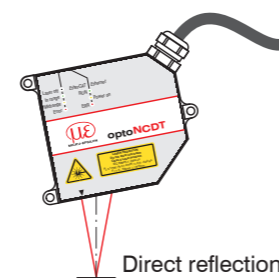

MR	2	5	10	20	50	100
SMR	24	24	30	40	45	70
MMR	25	26.5	35	50	70	120
EMR	26	29	40	60	95	170
Y	1.5	3.5	6.5	10	23	33.5

MR = Measuring range
SMR = Start of measuring range
MMR = Midrange
EMR = End of measuring range

Direct Reflection, Dimensions and free space, Measuring ranges 2/10/20 mm

Mounting holes 3x ø4.5 (dia. .18) for M4 screws

Direct reflection

Limits for free space

MR (direct reflection)

Mounting steps

➡ Switch on the supply voltage on the sensor.

➡ Watch the "State" LED on the top side of the sensor.

➡ Position a shining or mirroring measuring object within the measuring range.

➡ Move the fit-up aid between sensor and measuring object.

The "State" LED illuminates yellow.

➡ Mount the sensor by means of 3 screws type M4.

➡ Remove the fit-up aid between sensor and measuring object.

MR	SMR + 0.5 MR	alpha
2	25	20.5 °
5	26.5	20.5 °
10	35	17.5 °
20	50	13.8 °

SMR = Start of measuring range
MR = Measuring range

In case of bore holes, blind holes, and edges in the surface of moving targets the sensor must be arranged in such a way that the edges do not obscure the laser spot.
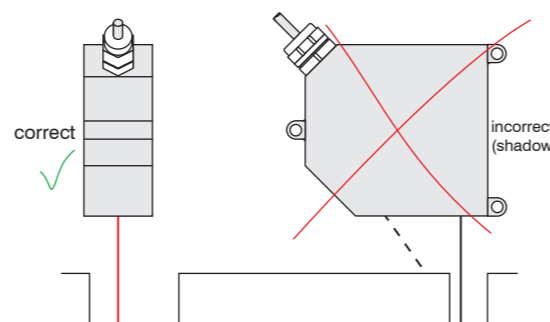

correct ✓

incorrect (shadow)

Input and Output

| Signal Designation	Sensor Pin	Comment	Cable PC2300-x/SUB-D[1] 15-pol. Sub-D
+ U$_b$	1	Supply voltage (11 ... 30 VDC)	1
Ground	2	System ground for supply and ground potential for RS422-level	9
+Laser on/off	3	optocoupler input, potential-free Laser off: U$_E$ ≤ 0,8 V (Low)	2
- Laser on/off	4	Laser on: 2,8 V ≤ U$_E$ ≤ 30 V (High)	10
Sync-in/out[2]	5	Synchronous- respectively trigger signals, symmetrically, RS422-Pegel, terminating resistor 120 Ohm switchable, input or output selected depending on the synchronization mode	3
/Sync-in/out[2]	6		11
RxD-RS422	7	Serial input RS422, symmetrically, Internally terminated with 120 Ohm	4
/RxD-RS422	8		12
TxD-RS422	9	Serial output RS422, symmetrically	5
/TxD-RS422	10		13
Tx - Ethernet	11	Ethernet output, potential-free	6
/Tx - Ethernet	12		14
Rx - Ethernet	13	Ethernet input, potential-free	7
/Rx - Ethernet	14		15
Screen	Housing	No galvanic connection to ground	Housing

1) Further cables are available optionaly.

2) In trigger operation the input is used for triggering.

Plug connector: ODU MINI-SNAP, 14-pol., series B, dimension 2, code F, IP 68. Sensor round pin plug, view: Solder-pin side male cable connector
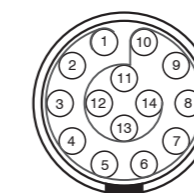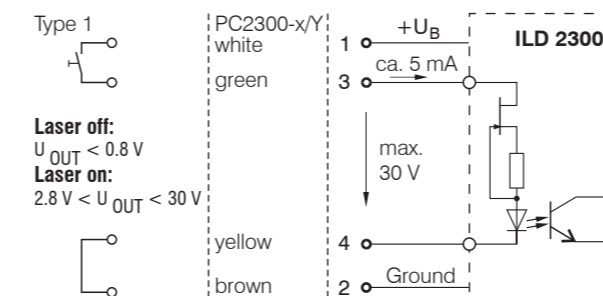

Supply Voltage, Nominal value: 24 V DC (11 ... 30 V, max. 150 mA).

Sensor Pin	PC2300-x/Y Color	Supply
1	white	+U$_B$
2	brown	Ground
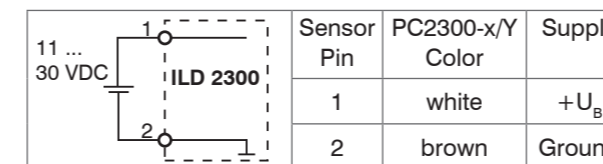
Use supply voltage for measurement instruments only. MICRO-EPSILON recommends using an optional available power supply unit PS2020 for the sensor.

Laser on

Laser off:
U$_{OUT}$ < 0.8 V
Laser on:
2.8 V < U$_{OUT}$ < 30 V

i If pin Pin 3 with +U$_B$ and Pin 4 are not connected with ground, the laser is off.

Proper Use

The optoNCDT 2300 system is designed for use in industrial and laboratory areas.

It is used for measuring displacement, distance, position and elongation for in-process quality control and dimensional testing

The sensor may only be operated within the limits specified in the technical data, see instruction manual, Chap. 3.4. Use the sensor in such a way that in case of malfunctions or failure personnel or machinery are not endangered.

Take additional precautions for safety and damage prevention for safety-related applications.

Warnings

Avoid unnecessary laser radiation to be exposed to the human body. Switch off the sensor for cleaning and maintenance, for system maintenance and repair if the sensor is integrated into a system. Caution - use of controls or adjustments or performance of procedures other than those specified may cause harm.

Connect the power supply and the display-/output device in accordance with the safety regulations for electrical equipment. The power supply may not exceed the specified limits.
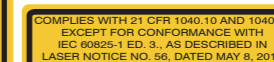> Danger of injury. Damage to or destruction of the sensor.

Avoid continuous exposure to fluids on the sensor. Avoid exposure to aggressive materials (washing agent, penetrating liquids or similar) on the sensor.
> Damage to or destruction of the sensor.

Avoid shock and vibration to the sensor. Protect the sensor cable against damage.
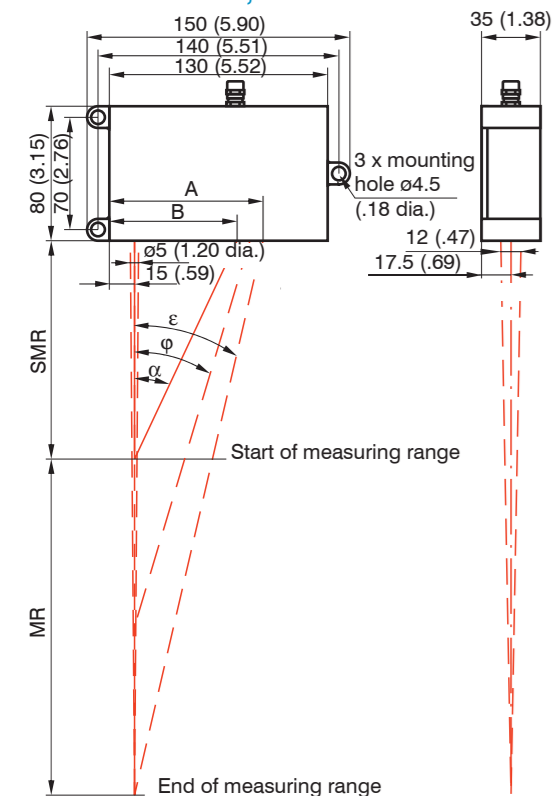> Damage to or destruction of the sensor , failure of the measuring device.

Laser Class

The optoNCDT 2300 sensors operate with a semiconductor laser with a wavelength of 670 nm (visible/red ILD 2300-x) resp. 405 nm (visible/blue ILD 2300-xBL).

The following warning labels are attached to the cover (front and/or rear side) of the sensor housing:

LASER RADIATION
Do not stare into beam
Class 2 Laser Product
IEC 60825-1: 2014
P$_0$ ≤1mW; P$_P$≤1.2mW; t=0.5...542 µs
F=1.5...50kHz; λ=670nm

COMPLIES WITH 21 CFR 1040.10 AND 1040.11
EXCEPT FOR CONFORMANCE WITH
IEC 60825-1 ED. 3, AS DESCRIBED IN
LASER NOTICE NO. 56, DATED MAY 8, 2019

LASER RADIATION
Do not stare into beam
Class 2 Laser Product
IEC 60825-1: 2014
P$_0$ ≤1mW; P$_P$≤1.2mW; t=0.5...542µs
F=1.5...50kHz; λ=405nm

IEC label   *Only for USA*   *IEC label for ILD2300-x BL*

⚠ **CAUTION** Never deliberately look into the laser beam! Consciously close your eyes or turn away immediately if ever the laser beam should hit your eyes.

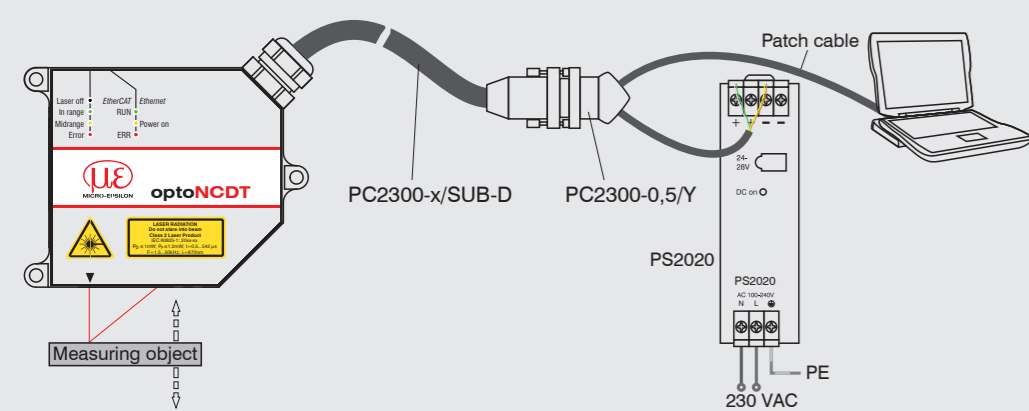## Diffuse Reflection, Dimensions for Measuring Range 40, 200 and 300 mm

Dimensions: 150 (5.90), 140 (5.51), 130 (5.52), 35 (1.38), ø80 (3.15), 70 (2.76), 3 x mounting hole ø4.5 (.18 dia.), 12 (.47), 17.5 (.69), ø5 (1.20 dia.) 15 (.59)

MR	40	200	300
SMR	175	130	200
MMR	195	230	350
EMR	215	330	500
α	22.1 °	25.1 °	18.3 °
φ	21.9 °	16.7 °	12.2 °
ε	21.8 °	13.1 °	9.6 °
A	101	91.6	99.4 °
B	86	76.0	81

Start of measuring range
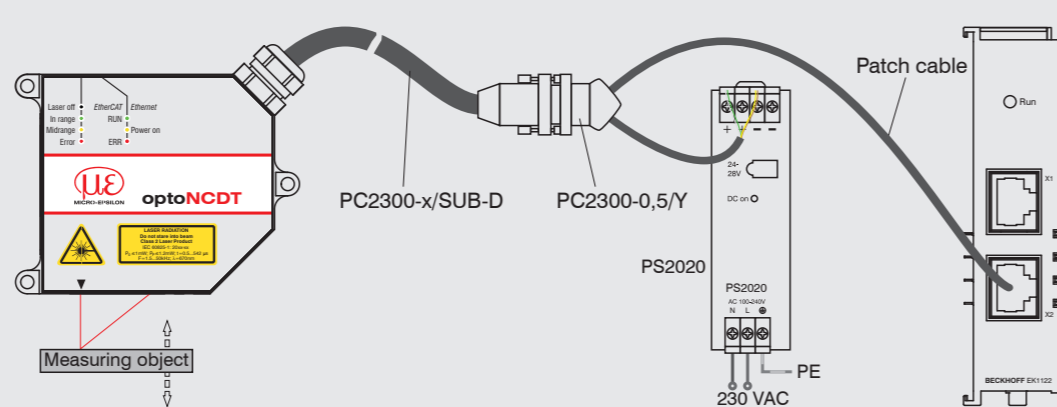
End of measuring range

Quick Guide

Components

- Sensor
- Power supply
- Laptop / PC + USB/Ethernet adapter + Ethernet cable

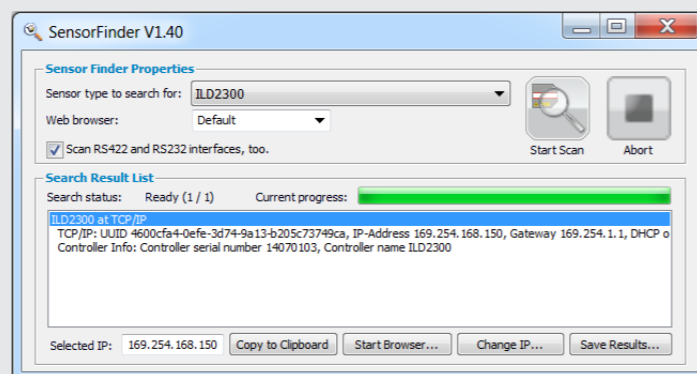➡ Mount the sensor and connect the components together.

Ethernet Connection

PC2300-x/SUB-D   PC2300-0,5/Y
PS2020
PS2020
230 VAC
PE
Patch cable
Measuring object

EtherCAT Connection

Patch cable
PC2300-x/SUB-D   PC2300-0,5/Y
PS2020
PS2020
230 VAC
PE
Measuring object

Commissioning

The sensor is delivered ex factory with the IP address 169.254.168.150.

You can check the IP address of the sensors, that are connected to a PC / network, with the SensorFinder.exe. program. You will find this program on the provided CD.

➡ Now start the program SensorFinder.exe and click on the button `Start scan`.
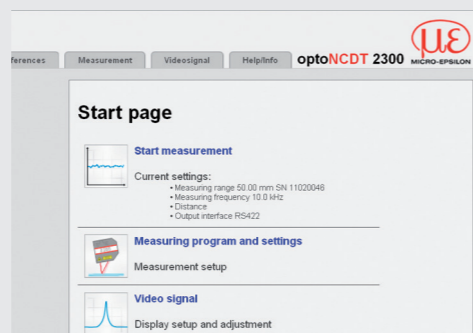
➡ Select the designated sensor from the list.

➡ Click the button `Start browser` to connect the sensor with your default browser.

Alternatively: If DHCP is enabled and the DHCP server is linked with the DNS server, an access is possible on „ILD2300_SN01234567" („01234567" Serial number of your sensor).

➡ Start a web browser on your PC. Type „ILD2300_Serial number" in the address bar of your web browser.

Interactive websites for programming the sensor now appear in the web browser.

➡ If you have changed any settings, go to the menu `Preferences` and click on the button `Save Setup` to store your settings.

Select a Measuring Program

➡ Go to the menu `Preferences > Measuring program`.

➡ Select `Diffuse reflection` from the measurement arrangement list. Confirm with `Apply`.

Select a Measuring Rate

➡ Go to the menu `Preferences > Measuring rate`.

Start with a medium measuring rate. Select a measuring rate from the list. Confirm with `Apply`.

Select a Digital Interface

➡ Go to the menu `Preferences > Digital interfaces > Selection of digital interfaces`.

➡ Select `Web Diagram` from the list. Confirm with `Apply`.

Store the Settings

➡ Go to the menu `Preferences > Load/save settings`.

➡ Select `Parameter set` from the data selection list, a parameter set number and click on the button `Save`.

Position a Measuring Object

➡ Position a measuring object (target) as possible in the midrange.
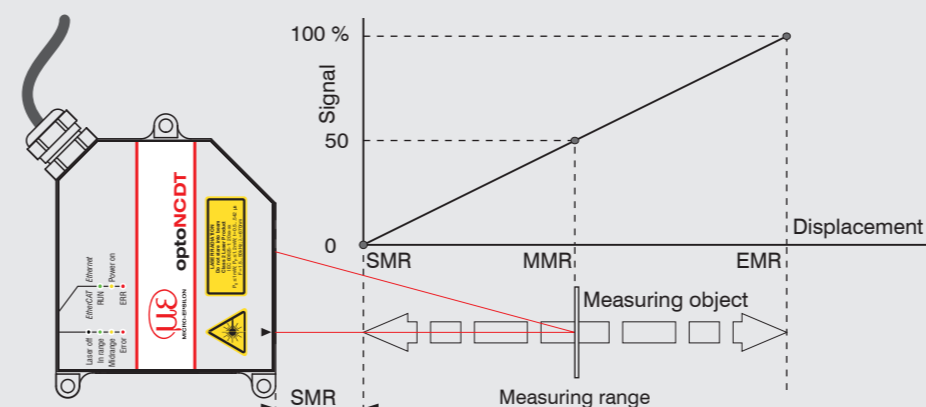
The Status LED Status on the sensor indicates the position of the measuring object to the sensor.

LED	Color		Labeling	Meaning
Status	○	off	Laser off	Laser beam is switched off
	☀	green	In range	Sensor operates, measuring object within measuring range
	☀	yellow	Midrange	Measuring object is in midrange
	☀	red	Error	Measuring object outside measuring range, reflection is to low

Displacement Measuring

➡ Go to the menu `Measurement`.

➡ Disable the `Autoscale` function and click on the `Start` button.
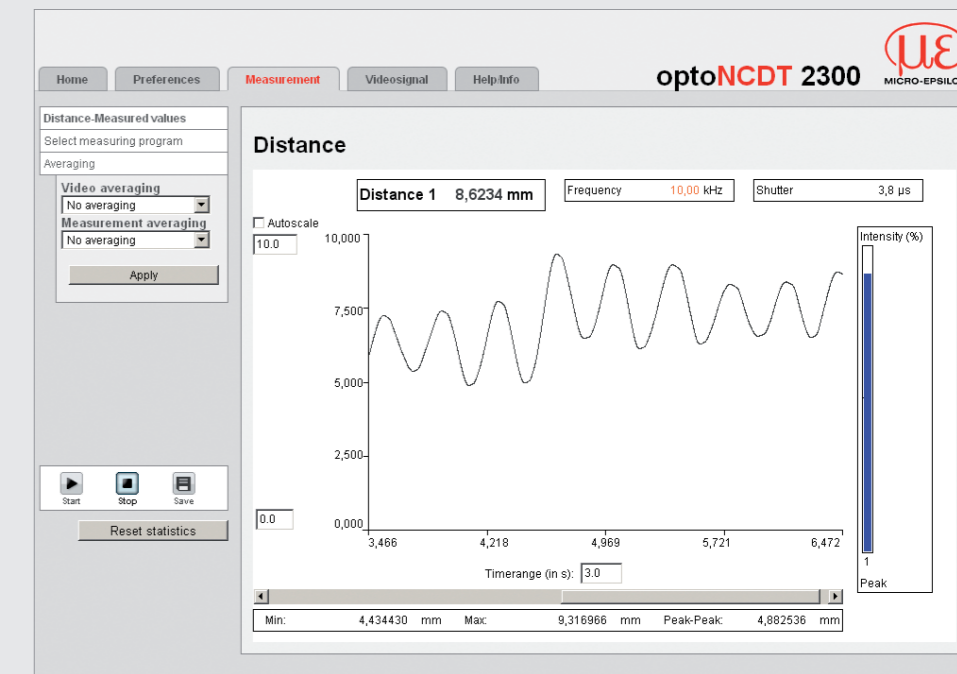
Thickness Measurement

➡ Got to the menu `Preferences > Measuring program` and select `Direct reflection – thickness measurement` from the measurement arrangement list.

➡ Select the target material from the material list. Confirm with `Apply`.

Store the Settings

➡ Go to the menu `Preferences > Load/save settings`.

➡ Select `Parameter set` from the data selection list, a parameter set number and click on the button `Save`.

Read the detailed instruction manual before using the sensor. The manual is available online on www.micro-epsilon.com/download/manuals/man--optoNCDT-2300--en.pdf or on the supplied CD.